

Kentucky Agricultural Experiment Station

University of Kentucky

- I. Winter Versus Summer Feeding of Corn to Heavy Steers Finished on Grass.**
- II. Wheat as a Fattening Feed for Yearling Steers.**
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BULLETIN NO. 332



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BULLETIN NO. 332

I Winter Versus Summer Feeding of Corn to Heavy Steers Finished on Grass.

By E. S. GOOD and W. J. HARRIS

Object of the Experiment. During the past fifty years the usual practice in fattening heavy steers in the Bluegrass Region of Kentucky has been to feed grain during the winter and to finish on grass the following summer without grain. During the past few years however an increasing number of feeders have fed grain to fattening steers on pasture instead of during the winter. The object of the experiment reported in this bulletin was to compare the two methods with respect to gains, economy of gains, degree of finish, and quality of carcass of fattening two-year-old steers. Three consecutive trials were conducted; the first in 1926-1927, the second in 1927-1928 and the third in 1928-1929. The steers were grazed on Walnut Hall Farm, one of the largest stock farms in Central Kentucky, located near Lexington. The management of this farm was so interested in this experiment as to allow the Experiment Station to graze the steers free of cost and in addition extended every courtesy possible. However, in the financial statements, a supposed charge of 10 cents a steer a day was made for the pasturage.

Plan of the Experiment. Each fall twenty native two-year-old steers were purchased from a local dealer. They were divided into two lots of ten each, as nearly alike as possible as to size, quality, condition and breeding. In the third trial nine steers were used in lot 2 because shortly after the cattle were put on feed one steer developed lumpy jaw and was removed from the experiment. The steers were confined to the barn from the time the experiment started until the date they were turned

on pasture. They had plenty of room for exercise, and received fresh running water in a concrete tank in one end of the barn. Salt was kept before them at all times and they received their feed twice daily.

In each trial, lot 1 received only roughage and cottonseed meal during the winter, while lot 2 received the same kind of roughage and cottonseed meal, in the same amounts, and in addition was fed broken ear corn. In this bulletin lot 1 will always be referred to as the one which did not receive corn in the winter and did receive corn on pasture, and lot 2 will be the one which received corn during the winter and was finished on grass without corn.

The steers were turned to pasture about the 10th of May. For two weeks before they were turned to pasture corn was added to the ration of lot 1 in order that the steers might be accustomed to eating it when they went to pasture. Corn was gradually reduced and silage increased in the ration of lot 2 so that these steers would not be dependent upon corn when they reached pasture. The steers in lot 1 were fed the same amount of corn during the grazing period that the steers in lot 2 received during the winter feeding period. Because the grazing period was much shorter than the winter period the average daily feed of corn per steer for lot 1 was greater than for lot 2.

It will be noted that a medium feed of corn was allowed. The steers were given an average of $13\frac{1}{2}$ bushels of broken ear corn per head in addition to the corn contained in the silage, which amounted to approximately 14 bushels per head, or a total of $27\frac{1}{2}$ bushels. This amount of corn was sufficient to produce a good market finish, not a prime finish. In all these experiments, however, the steers were fat enough to command the top prices of the Cincinnati livestock market.

The cattle were marketed each year at the Union Stock Yards in Cincinnati, Ohio. They were shipped to one of the old-line commission firms who received and handled them the same as they would cattle from an individual shipper, except that the two lots were kept separate and the steers were not

sorted as to market grades. Neither the commission men nor the buyers were given any information as to the manner in which the cattle had been fed, each lot standing on its own merits. Only once was a difference made by the buyers in the price of the two lots of cattle. This happened in the first trial, when the cattle fed corn on grass sold for \$12 a hundred as compared with \$11.75 for those finished on grass alone.

Feeds Used. The rations fed to lots 1 and 2 during the winter period were identical except that lot 2 received its allowance of corn during this time. The roughage rations fed were of sufficient amounts and quality to be termed, "good carrying feeds" for roughing steers thru the winter. In fact, the steers on the roughage ration alone made a fair gain during the winter. Feeds used during the winter feeding period in each experiment are given below:

First trial (1926-1927) lot 1 received cottonseed meal, corn silage, damaged soybean hay. Lot 2 received the same feeds and broken ear corn.

Second trial (1927-1928) lot 1 received cottonseed meal, corn silage, low-grade sweet clover hay. Lot 2 received the same feeds and broken ear corn.

Third trial (1928-1929) lot 1 received cottonseed meal, corn silage, and oat straw. Lot 2 received the same feeds and broken ear corn.

Prices of Feeds. The feeds used were charged to the steers at the following prices:

	First Trial 1926-1927	Second Trial 1927-1928	Third Trial 1928-1929
Corn, per bushel	\$.60	\$ 1.00	\$.80
Cottonseed meal, per ton	30.00	40.00	50.40
Corn silage, per ton	5.00	6.50	6.50
Soybean hay,* per ton	6.00		
Sweet clover hay,* per ton....		10.00	
Oat straw, per ton			12.00

*Very low grade.

All feeds except the hay were of good quality. The cotton-seed meal contained 41 percent protein.

Hogs. Hogs followed both lots of steers in the barn. Altho the steers in lot 1 did not receive corn, the silage was rather rich in corn and some pork was made each year by the pigs which followed lot 1. The pigs that followed lot 2, which received corn in the barn, made larger gains in each year than those that followed lot 1. Hogs were not permitted to run with the cattle on pasture because the Walnut Hall Farm management did not want pastures rooted up.

Shelter, Feed Lots and Water Supply. Each lot of steers was fed in the open-end type of beef-cattle barn, which gave access to sunlight and plenty of air. A concrete tank supplied water which was pumped from a running spring near the barn. The entire barn was kept bedded sufficiently deep to keep the cattle dry all the time and no trouble was experienced from sore feet.

Weights. The steers were weighed on three consecutive mornings at the beginning of the experiment and the average of these weights was taken as the starting weight. They were then weighed once each month during the feeding period. At the close of the winter or barn period, they were again weighed on three consecutive mornings and the average was taken for the final barn weight and the weight going on pasture. The steers were weighed once a month while on pasture, but because of the long distance they had to be driven they were weighed only once at the close of each trial. At the close of the first trial, however, the scales on the farm were found to be out of adjustment and the cattle could not be weighed before shipment. At the beginning of the experiment these scales were tested by an expert and found to be correct.

Method of Feeding During the Winter. Both lots were fed at seven o'clock in the morning and four o'clock in the afternoon, and the roughage and concentrates were given at the same time. The silage was put into the troughs and the grain placed on top of it.

Description of the Cattle. The cattle were two-year-old grade Shorthorn, Hereford and Angus steers which would grade as good feeders. An effort was made to buy good native steers, about 900 pounds in weight, but the average for the three years was about 920 pounds.

Sale of the Cattle. No attempt was made to place a value on the steers at the end of the winter feeding period or at the end of the grazing period. They were shipped to the Cincinnati livestock market where they were sold on their merits by one of the leading commission firms.

Labor. No charge was made for the labor involved in feeding and caring for the steers during the experiment nor was credit given for the manure produced.

RESULTS

The following pages show the rapidity of gains, the cost of gains, the dressing percent, the quality of beef and the net return of steers roughed thru the winter and fed corn on grass the following summer, as compared with steers of the same quality which were given corn and roughage during the winter and finished on grass without corn. The two lots were fed the same amounts of roughage and cottonseed meal during the winter. The tables show a small amount of corn consumed by the steers in lot 1 in the winter feeding period. This was fed to them during the last two weeks in the barn in order to get them accustomed to eating grain, before going to pasture.

The first trial was begun December 16, 1926, and ended July 18, 1927. The steers were fed in the barn from December 16, 1926, to May 11, 1927, when they were turned on pasture. They were marketed from grass July 18, 1927.

The second trial was begun December 16, 1927, and ended August 13, 1928. The steers were fed in the barn from December 16, 1927, to May 15, 1928, when they were turned on pasture. They were marketed from grass August 13, 1928.

The third trial was begun December 21, 1928, and ended July 22, 1929. The steers were fed in the barn from December 21, 1928, to May 11, 1929, when they were turned on pasture. They were marketed from grass July 22, 1929.

TABLE 1. AVERAGE GAIN PER STEER, BY PERIODS.

	Lot 1 Corn on Grass	Lot 2 Corn in Barn
1926-1927		
Number of steers per lot	10	10
Average gain per steer in barn (147 days)	245	277
Average daily gains per steer in barn (147 days)	1.67	1.88
Average gain per steer on grass (65 days)	83	24
Average daily gain per steer on grass	1.28	.37
Average gain per steer in barn and on grass (212 days)	328	301
Average daily gain per steer in barn and on grass (212 days)	1.55	1.42
1927-1928		
Number of steers per lot	10	10
Average gain per steer in barn (152 days)	231	285
Average daily gain per steer in barn (152 days)	1.52	1.87
Average gain per steer on grass (87 days)	195	141
Average daily gain per steer on grass (87 days)	2.24	1.62
Average gain per steer in barn and on grass (239 days)	426	426
Average daily gain per steer in barn and on grass (239 days)	1.78	1.78
1928-1929		
Number of steers per lot	10	9
Average gain per steer in barn (141 days)	229	230
Average daily gain per steer in barn (141 days)	1.62	1.63
Average gain per steer on grass (69 days)	159	136
Average daily gain per steer on grass (69 days)	2.30	1.96
Average gain per steer in barn and on grass (210 days)	388	365
Average daily gain per steer in barn and on grass (210 days)	1.85	1.74

Table 1 gives the average daily gain per steer by periods, in barn and on bluegrass pasture, and the total gains made per steer for each period and for the entire feeding period of each trial, which usually ran from December until July. Inasmuch as the steers in each lot were fed approximately the same feeds and in the same amounts each year, it is not surprising that the total gains were close together. The average gain for the three trials for the entire feeding period, winter and summer, for the steers in lot 1 (corn on grass) was 381 pounds, as compared with 364 for lot 2 fed corn in the barn. The average gains during the winter period for the three trials were 235 pounds for

the steers in lot 1 compared with 264 for the steers in lot 2. It would be natural to expect the steers in lot 2, which received corn during the winter, to make larger gains during the barn period, than those of lot 1. The average gains on grass were 146 pounds per steer for lot 1 as compared with 100 pounds per steer in lot 2.

Both lots of steers made very light gain on pasture in the first trial. This condition could not be accounted for only by the unusually wet season with "washy" grass, which made it a poor grazing year. Farmers in the Bluegrass Region generally experienced the same trouble. In the third trial both lots of cattle made light gains during the winter feeding period, but good gains on grass. In that trial the steers showed the least benefit from corn of any of the trials. This is true for the grazing period as well as the winter period, as a study of Table 1 will indicate. From this table it is seen that the steers in lot 1 showed almost as good results on the roughage ration as did the steers in lot 2 with the same roughage ration and a good feed of corn in addition. When they went to grass the steers in lot 1 were fed corn but the gains were only slightly higher than those of the steers in lot 2, which grazed without grain.

TABLE 2. AVERAGE AMOUNT OF FEED CONSUMED DAILY PER HEAD DURING WINTER FEEDING PERIOD.

	Lot 1	Lot 2
First Trial, 1926-1927		
Broken ear corn	.72	6.46
Cottonseed meal	1.96	1.97
Corn silage	49.90	49.85
Soybean hay	2.20	2.25
Second Trial, 1927-1928		
Broken ear corn	.69	6.41
Cottonseed meal	1.93	1.95
Corn silage	39.76	38.89
Sweet clover hay	6.49	6.51
Third Trial, 1928-1929		
Broken ear corn	1.01	7.23
Cottonseed meal	1.84	1.84
Corn silage	45.53	45.53
Oat straw	3.62	3.46

Table 2 shows the average amount of feed consumed daily per steer in each lot during the winter feeding period. It will be noted that the amounts of the feeds, except silage, were approximately the same each year. In the second trial, the supply of silage was limited and the steers were fed only about 39 pounds per head per day. For that reason they consumed considerably more roughage other than silage than they did in either of the other trials.

Table 3 shows the amount of each feed consumed for each pound of gain and the total cost for 100 pounds of gain during the winter feeding period.

TABLE 3. AVERAGE AMOUNT OF FEED CONSUMED PER POUND OF GAIN AND COST PER 100 POUNDS GAIN, DURING WINTER PERIOD.

	Lot 1 Corn on Grass	Lot 2 Corn in Barn
First Trial, 1926-1927		
Broken ear corn	.43 lbs.	3.43 lbs.
Cottonseed meal	1.18 lbs.	1.04 lbs.
Corn silage	29.94 lbs.	26.46 lbs.
Soybean hay	1.32 lbs.	1.19 lbs.
Cost per 100 pounds gain	\$ 9.88	\$11.13
Second Trial, 1927-1928		
Broken ear corn	.45 lbs.	3.41 lbs.
Cottonseed meal	1.27 lbs.	1.04 lbs.
Corn silage	26.10 lbs.	20.70 lbs.
Sweet clover hay	4.26 lbs.	3.47 lbs.
Cost per 100 pounds gain	\$13.37	\$14.93
Third Trial, 1928-1929		
Broken ear corn	.62 lbs.	4.43 lbs.
Cottonseed meal	1.13 lbs.	1.13 lbs.
Corn silage	28.03 lbs.	27.91 lbs.
Oat straw	2.23 lbs.	2.12 lbs.
Cost per 100 pounds gain	\$13.57	\$17.48

Tables 4, 5, and 6 give a summary of each trial, both in the barn and on grass. It will be noted that the steers in lot 1 showed a more satisfactory return each year except one than did those in lot 2. While the difference is not great, it is sufficient to be considered by the beef-cattle feeders of the state.

TABLE 4. SUMMARY OF FIRST TRIAL, 1926-1927.

	Lot 1 10 steers (Corn on grass)	Lot 2 10 steers (Corn in barn)
In Barn Period		
Average weight of steers at beginning.....	881 lbs.	902 lbs.
Average weight of steers to grass	1,126 lbs.	1,179 lbs.
Average gain per steer	245 lbs.	277 lbs.
Average daily gain per steer (147 days).....	1.67 lbs.	1.88 lbs.
Total feed:		
Broken ear corn	1,065 lbs.	9,500 lbs.
Cottonseed meal	2,885.5 lbs.	2,890 lbs.
Corn silage	73,350 lbs.	73,290 lbs.
Soybean hay	3,235 lbs.	3,805 lbs.
Total cost of feeds consumed	\$245.40	\$317.88
Less value of pork produced (Lot 1, 35 lbs.; Lot 2, 104 lbs.)	3.24	9.62
Net cost of feeds to steers	242.16	308.26
Cost of 100 pounds gain	9.88	11.13
Initial cost of steers, at \$7.65 per 100 lbs.....	673.96	690.03
Cost of steers plus cost of feed	916.12	998.29
On Grass Period		
Average weight of steers when turned to grass	1,126 lbs.	1,179 lbs.
Average weight of steers at market	1,209 lbs.	1,203 lbs.
Average gain per steer	83 lbs.	24 lbs.
Average daily gain per steer (65 days).....	1.28 lbs.	.37 lbs.
Broken ear corn consumed	8,610 lbs.	—
Corn per steer per day	13.13 lbs.	—
Cost of corn	\$ 73.80	—
Cost of grass @ 10c per steer per day	65.00	\$ 65.00
Total cost of corn and grass	138.80	65.00
Cost of 100 pounds gain	16.72	27.08
Entire Feeding Period		
Total cost of feeds and pasture, less pork produced	\$ 380.96	\$ 373.26
Cost of 100 pounds gain	11.92	12.40
Actual selling price per 100 pounds.....	12.00	11.75
Gross returns (market weight)	1,450.80	1,413.52
Less shipping expense (\$43.36 each lot).....	1,407.44	1,370.16
Total cost of steers, feed and pasture	1,054.92	1,063.29
Income over feed and shipping expense	352.52	306.87
Income per steer	35.25	30.68

TABLE 5. SUMMARY OF SECOND TRIAL, 1927-1928.

	Lot 1 10 steers (Corn on grass)	Lot 2 10 steers (Corn in barn)
In Barn Period		
Average weight of steers at beginning.....	956 lbs.	944 lbs.
Average weight of steers to grass.....	1,187 lbs.	1,229 lbs.
Average gain per steer.....	231 lbs.	285 lbs.
Average daily gain per steer (152 days).....	1.52 lbs.	1.87 lbs.
Total feed:		
Broken ear corn.....	1,050 lbs.	9,740 lbs.
Cottonseed meal.....	2,935 lbs.	2,965 lbs.
Corn silage.....	60,435 lbs.	59,110 lbs.
Sweet clover hay.....	9,870 lbs.	9,900 lbs.
Total cost of feed consumed.....	\$ 319.41	\$ 439.97
Less value of pork produced (Lot 1, 100 lbs. Lot 2, 140 lbs.).....	9.75	13.65
Net cost of feeds to steers.....	309.66	426.32
Cost of 100 pounds gain.....	13.37	14.93
Initial cost of steers at \$9 per 100 pounds.....	860.40	849.60
Cost of steers plus cost of feed.....	1,170.06	1,275.92
On Grass Period		
Average weight of steers when turned to grass.....	1,187 lbs.	1,229 lbs.
Average weight of steers when shipped (at farm).....	1,382 lbs.	1,370 lbs.
Average weight of steers at market.....	1,350 lbs.	1,308 lbs.
Average gain per steer.....	195 lbs.	141 lbs.
Average daily gain per steer (87 days).....	2.24 lbs.	1.62 lbs.
Broken ear corn consumed.....	8,680 lbs.	-----
Corn per steer per day.....	10 lbs.	-----
Cost of corn.....	\$ 124.00	-----
Cost of grass @ 10c per steer per day.....	87.00	\$ 87.00
Total cost of corn and grass.....	211.00	87.00
Cost of 100 pounds gain.....	10.82	6.17
Entire Feeding Period		
Total cost of feeds and pasture, less pork produced.....	\$ 520.66	\$ 513.32
Cost of 100 pounds gain.....	12.22	12.04
Gross returns (market weight) @ \$14.50 per cwt.....	1,957.50	1,896.60
Less shipping expense (\$46.98 each lot).....	1,910.52	1,849.62
Total cost of steers, feed and pasture.....	1,381.06	1,362.92
Income over feed and shipping expense.....	529.46	486.70
Income per steer.....	52.94	48.67

TABLE 6. SUMMARY OF THIRD TRIAL, 1928-1929.

	Lot 1 10 steers (Corn on grass)	Lot 2 9 steers (Corn in barn)
In Barn Period		
Average weight of steers at beginning.....	922 lbs.	926 lbs.
Average weight of steers to grass	1,152 lbs.	1,156 lbs.
Average gain per steer	230 lbs.	230 lbs.
Average daily gain per steer (141 days).....	1.63 lbs.	1.63 lbs.
Total feed:		
Broken ear corn	1,425 lbs.	9,180 lbs.
Cottonseed meal	2,595 lbs.	2,335 lbs.
Corn silage	64,195 lbs.	57,776 lbs.
Oat straw	5,100 lbs.	4,388 lbs.
Total cost of feeds consumed	\$ 320.48	\$ 377.39
Less value of pork produced (Lot 1, 85 lbs.; Lot 2, 148.5 lbs.)	8.92	15.59
Net cost of feeds to steers	311.56	361.80
Cost of 100 pounds gain	13.57	17.48
Initial cost of steers @ \$12 per 100 pounds	1,107.00	1,000.80
Cost of steers plus cost of feed	1,418.56	1,362.60
On Grass Period		
Average weight of steers when turned to grass	1,152 lbs.	1,156 lbs.
Average weight of steers when shipped (at farm)	1,311 lbs.	1,292 lbs.
Average weight of steers at market	1,260 lbs.	1,266 lbs.
Average gain per steer	159 lbs.	136 lbs.
Average daily gain per steer (69 days).....	2.30 lbs.	1.96 lbs.
Broken ear corn consumed	8,865 lbs.	
Corn per steer per day	12.85	
Cost of corn @ 80c per bushel	\$ 101.28	
Cost of grass at 10c per steer per day	69.00	\$ 62.10
Total cost of corn and grass	170.28	62.10
Cost of 100 pounds gain	10.70	5.11
Entire Feeding Period		
Total cost of feeds and pasture, less pork produced	\$ 481.84	\$ 423.90
Cost of 100 pounds of gain	12.41	12.90
Gross returns (market weight) @ \$13.25 per cwt.	1,669.50	1,497.78
Less shipping expense (Lot 1, \$46.69; Lot 2, \$42.02)	1,622.81	1,455.76
Total cost of steers, feed and pasture	1,588.84	1,424.70
Income over feed and shipping expense	33.97	31.06
Income per steer	3.39	3.45

Slaughtering the Cattle. The cattle were bought each year by the same packer in Cincinnati and were slaughtered at its local plant. They were followed thru the slaughtering house in order to determine any difference in the dressing percentage, color and quality of meat and grades of carcasses. So far as the superintendent of the beef department of the firm and mem-

bers of the Animal Husbandry Department of the Station were able to determine, there was no noticeable difference in the carcasses of the steers in lot 1 compared with those of the steers in lot 2, nor was there any material difference in the dressing percentages, altho the steers in lot 2 yielded a slightly higher percent than those of lot 1. The dressing percentages were computed on Cincinnati weights. The steers in lot 1 (corn on grass) yielded 58.78 percent as compared with 58.60 percent for lot 2 (corn in barn) in the first trial; 58.70 percent as against 60.21 in the second; and 56.94 percent as compared with 57.33 in the third. Lot 1 had a decided advantage over lot 2 in regard to shrink in shipping. The cattle in lot 2, finished on grass, showed more shrink in shipment than the grain-finished cattle in lot 1, in all trials except the first, in which weights were not taken at the farm.

CONCLUSIONS

1. Heavy steers carried thru the winter on a good roughage ration alone and finished on grass with corn made larger and more profitable gains than steers of equal weight, quality and grade that received corn during the winter and were finished on grass alone.

2. The steers roughed thru the winter and finished on grass with corn had a decided advantage in shipping to market, as the shrink per head averaged 15 to 30 pounds less than that of the steers finished on grass alone.

3. Feeding corn to steers during the grazing period was more profitable by \$2.90 per head than feeding the same amount of corn during the winter period and finishing on grass without grain. While this does not appear to be very much on a small lot of cattle, it would amount to a considerable sum if applied to all the cattle in Kentucky which are carried thru the winter and finished on grass.

4. Neither method of feeding held a decided advantage in dressing percentage, in amount of fat, in color or in weight. In other words, it appears that cattle of this size and type take on a certain finish regardless of whether they receive the grain dur-

ing the winter or during the summer. However, it must be borne in mind that these steers were marketed in July or early August. If they had been kept on pasture until the fall of the year the color and finish of carcass probably would have been in favor of the lot that received corn on grass.



Fig. 1. Group of the steers in lot 1 in the first trial, 1926-1927. The cattle in this lot were fed corn on grass.



Fig. 2. Group of the steers in lot 2 in the first trial, 1926-1927. These cattle were grazed without grain.

II Wheat as a Fattening Feed for Yearling Steers.

By E. S. GOOD and W. J. HARRIS

Object and Plan. Owing to the unusual surplus in 1930, the farmers of the country were faced with the problem of how to market their wheat to the best advantage. They were advised to feed wheat to livestock rather than take the prevailing market price. Considerable experimental work had been done in comparing the rapidity and economy of gains produced in feeding wheat to hogs, as compared with other grains, especially corn. Few experiments, however, had been conducted in feeding wheat to fattening steers. This experiment was undertaken to obtain information as to the efficiency and economy of wheat as a fattening feed for steers, with corn silage as the major roughage, as compared with corn under the same conditions. The quality of carcass produced by the two feeds was also given consideration.

Late in October, 1930, twenty range-bred grade Hereford yearling steers that rated good to choice were purchased for the experiment. They were selected for uniformity of size, quality and breeding, from a drove of thirty-five head. The steers were divided into two lots of ten each, giving most consideration to weight and quality. They were weighed on three successive mornings at the beginning and end of the experiment and the average of the three weights was taken as the initial and ending weights.

Each lot of steers occupied a pen 18 by 75 feet, which was under roof. The water tanks were under cover. Fresh water was always accessible and steers were kept well bedded.

Lot 1, known in this report as the wheat-fed steers, was fed a ration consisting of corn silage, cracked wheat, cottonseed meal, and oat straw. Lot 2 received exactly the same ration except that shelled corn was given instead of wheat. The wheat fed was coarsely cracked. Shelled corn was fed because that is the form commonly used in this state in fattening long yearlings or two-year-old steers if broken ear corn is not employed.

Finely ground limestone and salt were before each lot of cattle thruout the trial and accurate weights were kept of the amounts of each mineral consumed. Care was taken to feed exactly the same amount of silage, grain and cottonseed meal to each lot. The slight variation noted in Table 7 is explained by the fact that one steer in lot 2 was off feed for a few days and a slight reduction in the quantity of feeds allowed that lot was necessary. The silage was weighed and put into the feed troughs first. Then the grain and cottonseed meal were added. The ration was divided into two equal parts and fed morning and night. At no time were the cattle allowed more feed than they would clean up promptly. None of the steers that received wheat went off feed at any time during the feeding trial. The steer in lot 2 that was off feed for a few days made a quick recovery and was one of the best of the lot when marketed.

As a control and to determine the physical effects of a full feed of wheat when corn silage was not used, a lot of beef cattle was fed mixed hay, wheat and cottonseed meal. These cattle were inclined to bloat, scour and go off feed. When corn silage was introduced into the ration this ailment disappeared. There was no bloating or scouring when the grain ration consisted of half wheat and half crushed barley or corn, even when no silage was fed.

RESULTS

Table 7 gives a summary of the feeding trial. The wheat-fed steers made a larger average daily gain than those fattened on corn, and the cost per hundred pounds of gain was less than for the steers fed corn. However, most pork was made behind the steers that were fed corn. The steers consumed more limestone than was expected, the average daily consumption being slightly in excess of $2\frac{1}{4}$ ounces per steer in each lot. This finely ground limestone was placed in one section of the feed trough and the steers licked it at will.

Both lots of steers were shipped to the Cincinnati market where they were sold separately, on their merits, without disclosing to anyone how they had been fed. Lot 1 sold for \$7.90

per hundredweight and lot 2, \$7.70. They were sold to a Cincinnati packer thus affording an opportunity of comparing the carcasses.

The wheat-fed steers showed a greater degree of finish than those fattened on corn, and also yielded a higher percentage of beef. The steers in lot 1 dressed 60 $\frac{1}{2}$ percent while those in lot 2 dressed 60 percent. The carcasses of the wheat-fed steers had a deeper covering over the back and ribs, whiter fat and brighter red lean meat than those of the steers finished on corn. The carcasses of the corn-fed steers appeared to be slightly firmer than those of the wheat-fed steers but an analyses of the fat taken from the backs and kidneys of the steers in each lot showed it to be identical.

The wheat-fed steers made larger and more economical gains and sold for a higher price per hundredweight than the

TABLE 7. CORN vs. WHEAT FOR FATTENING STEERS RECEIVING CORN SILAGE

	Lot 1 Wheat 10 Steers	Lot 2 Corn 10 Steers
Average weight of steers at beginning.....	719 lbs.	723 lbs.
Average weight of steers at finish	1,135 lbs.	1,086 lbs.
Average gain per steer (176 days)	416 lbs.	363 lbs.
Average daily gain per steer (176 days).....	2.36 lbs.	2.06 lbs.
Average daily feed per steer:		
Cracked wheat	12 lbs.	
Shelled corn		11.9 lbs.
Cottonseed meal	2 lbs.	2 lbs.
Corn silage	25.7 lbs.	25.5 lbs.
Oat straw	1.33 lbs.	1.47 lbs.
Ground limestone	2.24 ozs.	2.24 ozs.
Salt	.38 ozs.	.38 ozs.
Total cost of feeds consumed	\$ 493.66	\$ 490.97
Less value of pork produced (Lot 1, 355 lbs.; Lot 2, 390 lbs.)		19.25
Net cost of feeds to steers	476.04	471.72
Cost per cwt. of gains	11.44	13.00
Initial cost of steers @ \$8 per cwt.	575.20	578.40
Cost of steers plus cost of feed	1,051.24	1,050.12
Actual selling price per cwt.	7.90	7.70
Gross income less market expense (\$41.67 per lot)	854.98	794.55
Loss per steer	19.62	25.55

Cost of Feeds: Cottonseed meal \$34.50 per ton; oat straw \$14 per ton; corn silage \$5 per ton; corn 80c per bu.; wheat 30c per bu. plus \$2.00 per ton for cracking; ground limestone \$3 per ton; salt 1c per lb.

corn-fed steers. The table shows a loss of \$19.62 a head in lot 1 and \$25.55 a head in lot 2. The drop in the cattle market from the time these steers were purchased until they were sold accounts for this loss.

